*Marcou, J., and Marcou, J. B.*—Mapoteca Geologica Americana. A catalogue of geol. maps of Amer., N. and S., 1752–1881. Bull. U. S. Geol. Surv., No. 7.

*Irving, R. D., and Van Hise, C. R.*—On secondary enlargements of mineral fragments in certain rocks. Bull. U. S. G. S., No. 8.

*Clarke, F. W., and Chatard, T. M.*—A report of work done in the Washington laboratory 1883–1884. Bull. U. S. G. S., No. 9.

*Walcott, C.*—On the Cambrian faunas of N. Am. Bull. U. S. Geol. Surv., No. 10.

*Call, R. E., and Gilbert, G. K.*—On the Quaternary and recent Mollusca of the Great basin, also a sketch of the Quaternary lakes. Bull. U. S. G. S., No. 11.

*Dana E. S.*—A crystallographic study of the thinolite of Lake Lahontan. Bull. U. S. G. S., No. 12.

*Burns, C., and Stronhal, V.*—The electrical and magnetic properties of the iron carburets. Bull. U. S. G. S., No. 14.

*Gannett, H.*—Boundaries of the United States, of the States and Territories. Bull. U. S. Geol. Surv., 13. All from the department.

Third annual report of the board of control of the N. Y. Agric. Experiment Station, 1884. From the board.

*Heilprin. A., and Meyer, O.*—Notes on the classification and palæontology of the U. S. Tertiary deposits. Science, June 12, July 17, July 31, Aug. 21.

*Boettger, O.*—Liste d. v. Hrn. Dr. med. W. Kobelt in Algerien und Tunisien gesammelten Kriechthiere, 1885. From the author.

*Dollo, M. L.*—L'appareil sternal de L'Iguanodon. Ext. d. l. Rev. d. Quest. Scien., Oct., 1885. From the author.

*James, J. F.*—Remarks on a supposed fossil fungus from the coal measures. Ext. Jour. Cin. Soc. N. H., Oct., 1885. From the author.

*Agassiz, A., and Whitman, C. O.*—The development of osseous fishes. Mem. Mus. Comp. Zool., Camb., Vol. XIV, No. 1, Part 1, 1885. From the authors.

*Hull, E.*—On the geological age of the North Atlantic ocean. Sci. Trans. Roy. Dublin Soc., 1885. From the author.

*Everhart, B. M.*—Index to Ellis' North American fungi. From the author.

*Baker and Harrigan.*—Catalogue of trotting stock, Great Meadow farm, 1886.

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# GENERAL NOTES.

## GEOGRAPHY AND TRAVELS.[1]

ASIA.—*The Trigonometrical Survey of India.*—At the meeting of the British Association, held at Aberdeen in September of this year, the president of the geographical section, General J. T. Walker, gave an account of the survey of Hindostan. Survey operations along the coast-lines began before the commencement of the seventeenth century, and the first general map of India, published by D'Anville in 1752, was compiled from the charts of coast-lines and the itineraries of travelers. Major Rennell, appointed surveyor of Bengal in 1764, was the father of Indian geography. In nineteen years he surveyed 300,000 square miles, and after his return to England, published a great work on Indian geography. At the close of the last century Major Lambton drew up a project for a general triangulation of Southern India. He commenced work by a careful triangulation of Southern India, but for several years no notice was taken of his import-

[1] This department is edited by W. N. LOCKINGTON, Philadelphia.

ant services to science. In 1817 the French institute elected him a corresponding member, and after this honors and applause followed from his own countrymen. His assistant, Captain Everest, discovered that Lacaille's meridional arc, at the Cape of Good Hope, was in error through the deflection of the plumb-line at the ends of the arc, under the influence of the attraction of the neighboring mountains, and thus became aware of the necessity of placing astronomical stations where this cause would not be active. Everest introduced great improvements into the methods of the survey, which, before Lambton's death, had been extended in its scope to embrace the whole of India, and his methods were followed until the completion of the principal triangulation. Many of the forest regions of India are most pestilential. Native troops mutinied at being taken into the Godavery basin, for fifty years the chain of triangles passing through it remained untouched, and its execution cost the life of the officer in charge. The Terai, at the base of the Nepalese Himalayas, was still more formidable, yet, owing to the refusal of the Nepalese government to permit Europeans to enter their territory, a connecting chain of triangles had to be carried along its 500 miles, necessitating the clearance of some 2000 miles of line through forest and jungle, and the construction of over 100 towers to overlook the earth's curvature. The mortality was greater than in many a famous battle. In 1843 Everest was succeeded by Waugh, who retired in 1861, and the last chain of the principal triangulation was completed in 1882.

The two longitudinal arcs first measured in India were employed by Colonel Clarke in his last investigation of the figure of the earth, and General Walker stated his belief that they are the only two arcs sufficiently accurate to be thus used. These investigations show that the equator has much less ellipticity than was formerly believed, and that the major axis is 8° 15′ west of Greenwich, instead of 15° 34′ east of it, as was previously supposed. The French meter, supposed to be a ten-millionth part of the earth's meridional quadrant, is now known to be nearly $\frac{1}{5000}$th part less than the magnitude it was intended to represent.

*Mr. Hosie's Travels in China.*—At the recent meeting of the British Association Mr. A. Hosie gave an account of three journeys in Southwestern China made by him since the beginning of 1882. The first was through Southern Ssu-ch'uan and Northern Kweichou to its capital, Kwei-yang-Fu, westward to Yunnan Fu, then through Northern Yunnan and along the Nan-kuang river to the Yang-tsze, where he took boat to Ch'ung-ch'ing, his starting-point. In 1883 he passed to Ch'êng-tu, the capital of Ssu-ch'uan, by way of the brine and petroleum wells of Tzu-liu-ching, then through the country of the Lolos, then by Ning-yüan, in a valley famous as the habitat of the white-wax insect, to and through the mountainous Cain-du of Marco Polo, inhabited in

great part by Mantzu tribes. Reaching the Chin-sha Chiang or river of golden sand, he then proceeded to Ta-li Fu and Yunnan Fu, when he descended the Yung-ning river to Lu Chou. In 1884 he went to Ho Chou, north of Ch'ung-Ch'ing, thence through a cultivated and fertile country to Chia-ting Fu, on the right bank of the Min and thence south on the eastern side of independent Lolodom, to the river of Golden Sand at the town of Man-i-ssu. Chia-ting is the great center of sericulture in Ssu-ch'uan, and the chief insect wax-producing city in the empire. A day's journey from it is the famous mount O-mei, 11,000 feet high, sacred to the worship of Buddha.

*Asiatic News.*—The total forest area of British India is computed at 75,270 square miles.——Colonel Prejevalsky has again failed to penetrate into Tibet over the Keria mountains in consequence of the strenuous opposition of the Chinese.——Dr. Otto Finsch has explored 1000 miles of the coast of Northern (German) New Guinea, has discovered several good harbors, and has followed a large river thirty miles into the interior. The interior is mountainous, the plains near the sea are richly covered with trees and bush and well watered, the soil is of the richest fertility, and the natives are friendly. Dr. Finsch found no trace of minerals, and regards the reported discovery of gold on the Fly river as a "schwindel."

AFRICA.—*Somaliland.*—The October issue of the Proceedings of the Royal Geographical Society, contains F. L. James's account of his journey through the Somali country to the Webbe Shebeyli. The journey was in many respects the most successful that has ever been made in that region, since the party succeeded in penetrating Ogadayn, more than half crossing the peninsula, and returning without a contest. The return was, however, compelled by the attempt of the Sultan of Barri to make his visitors assist him against his rival. The greatest danger to which the travelers were exposed, arose from Lord Granville's telegram forbidding the expedition to proceed. This arrived after their departure, but its open publication in Berbera caused the Somali to believe that the travelers were in disfavor with the British government. Firearms were new to the Somali of Ogadayn, and the rifles insured respect. Most of the country appears to be a stony desert, but settlements are abundant on the Webbe, which does not reach the ocean, but loses itself a few miles from the coast. In Ogadayn there is a subject people called Adone, with strongly-marked negro features. About 150 species of plants, chiefly herbs and under-shrubs, were brought back, including a specimen of an apocynaceous plant which affords an arrow-poison. Sixty-one species of birds, seven of which are new, and forty-six kinds of Lepidoptera, seventeen of them new, were also brought back. The genealogy of the Somali tribes is given. They are all said

to be descended from two brothers, Darode and Tsak, Ogadayn was a son of the former.

*The Lake Mœris.*—Mr. Cope Whitehouse described to the British Association the basin of the Reian Mœris in Egypt, and spoke of the possibility of the restoration of this historic lake. South of the Fayoum exists a depression of several hundred square miles, not less than 150 feet below the Mediterranean, and in the parts visited by the writer, 175 to 180 feet deep. The area is irregular, curving like a horn from near Behnessa to the ridge which separates it from the Fayoum. Ruins exist in its southern part. The level of the ruins proved that the ancient station of Ptolemais might have been as shown in the text and maps of Ptolemy, on a horn-shaped lake about thirty-five miles long and fifteen wide.

*The Kassai Tributary of the Congo.*—Lieut. Wissman speaks enthusiastically of the Kassai as a magnificent fluvial artery, frequently of enormous breadth, leading into the heart of the new Congo State. The country on its banks is of wonderful fertility. During the forty-two days occupied in the voyage from Luluaburg to Kwamouth, the health of the expedition was excellent, the five whites and 200 negroes all arriving in good health at Leopoldville on July 16th. The Sankaru and Lubilash are one river, which turns westward, and joins the Kassai. The Kassai receives the great Kòango, and enters the main river by the Kwamouth, after receiving the waters of Lake Leopold.

*African News.*—The country between Blantyre and Quillimane has been described by Mr. H. E. O'Neill and Mr. D. J. Rankin in the Proceedings of the Royal Geographical Society. The Portuguese authority has recently been considerably extended up the Shiré towards Lake Nyassa.——The Kassai, the great southern tributary of the Congo, instead of entering the main stream north of the equator, joins it in 3° 13′ S. lat.——Mr. D. D. Veth, leader of a Dutch expedition into Portuguese West Africa, died on May 10th, between Benguela and Humpata.

## GEOLOGY AND PALÆONTOLOGY.

Internal Chemical and Mechanical Erosion a Factor in Continent and Mountain Building.—As soon as it is affirmed that since early Laurentian times the great continental folds and depressions have not changed places, so soon it becomes necessary to explain how these great ridges and troughs have persisted, as such, in spite of the amount of erosion and sedimentation which are known to have taken place and which we know to be still going on at no small rate. Either the pre-Laurentian inequalities of surface were vastly greater than they are now, or else, during all the ages the ocean beds have been constantly receiving sediment and sinking, while the continents have been as constantly eroded and rising. But this latter hypothesis implies